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SOUTHERN FOREST EXPERIMENT STATION

E. L. Demmon, Director

New Orleans, La.

SAWTIMBER AND CORDWOOD VOLUMES IN SOUTHWEST LOUISIANA

A Progress Report

By

THE SOUTHERN FOREST SURVEY

I. F. Eldredge

Regional Survey Director

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* - This is an advance release of Forest Survey data that will be included in complete reports to be published later. This information is subject to correction or amplification as computations proceed.

FOREWORD

The nation-wide Forest Survey, being made by the United States Forest Service, was authorized by the McSweeney-McNary Forest Research Act of 1928. Its five-fold object is: (1) to make an inventory of the present supply of timber and other forest products, (2) to ascertain the rate at which this supply is being increased through growth, (3) to determine the rate at which this supply is being diminished through industrial and local use, windfall, fire, and disease, (4) to determine the present requirement and the probable future trend in the requirement for timber and other forest products, and (5) to correlate these findings with existing and anticipated economic conditions in order that policies can be formulated for the effective use of land suitable for forest production.

In the South, the Forest Survey functions as an activity of the Southern Forest Experiment Station with headquarters at New Orleans, La.

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SAWTIMBER AND CORDWOOD VOLUME

IN SOUTHWEST LOUISIANA

The forest survey unit which embraces southwest Louisiana (see figure 1) extends west from the prairie section and the Delta to Texas; and from Cameron Parish north for over 120 miles to the north boundaries of Sabine, Grant, and LaSalle Parishes and to the Red River in Natchitoches Parish. It includes all of six parishes and parts of seven others, an area of 5,774,200 acres, almost four-fifths of which is forest land. From a prairie and flatwoods belt extending across the southern part of the unit and averaging about 25 miles in width, rolling uplands rise gradually to the northern boundary, where elevations exceed 300 feet.

Originally, except in a few sections, this region was covered with one of the finest longleaf-pine forests in the South. At the present time, only a few large tracts of virgin pine and hardwood timber remain, all of which are owned by operating lumber companies. In the northern part of the region, from which the original timber has been cut, most of the forest area is becoming re-stocked with loblolly and shortleaf pines; while the central portion is characterized by extensive clear-cut areas that have not as yet restocked; and the south and southwestern portions support some fairly well stocked stands of second growth. Only a small part of the region - chiefly the prairie and Red River Valley sections - is devoted to agriculture; but within the unit, or in adjoining areas, large quantities of oil, natural gas, sulphur, common salt, and alkali are produced.

The region is traversed by the lines of six major railroads, and two or three smaller railroads serve parts of it. A good system of hard-surfaced and improved country roads connects the principal points. Port facilities are available at Lake Charles, which is also on the Intracoastal Waterway.

Information presented in this release is based on data gathered during 1934 and 1935 by the Southern Forest Survey, an activity of the Southern Forest Experiment Station of the U. S. Forest Service. Trained cruisers measured the timber and recorded the forest and land-use conditions on over 7,000 quarter-acre sample plots systematically located at intervals of 660 feet on parallel compass lines, 10 miles apart, run entirely across the area from east to west. The preliminary estimates presented here are subject to revision later in final survey unit reports.

Owing to the sampling method used in collecting these data, it usually holds that the greater the area or volume in any given classification the more accurate are the data for that classification. Classes that are of infrequent occurrence and relatively small in quantity cannot generally be determined with as high a degree of accuracy as is obtainable for classes that occur more frequently and in substantially greater quantities. Area and volume figures are given for some of the less common classifications despite a knowledge that they may have a relatively large error. Data for any classification totaling less than one percent of the total should be considered as indicating only the relative magnitude of that item.

Land Area and Use

In table 1, the land area is classified according to its major uses.

Table 1. -- Land area classified according to use

Land use	Area in acres		Percent of total area	
Forest:				
Productive	4,541,900		78.7	
Nonproductive 1/	1,600		negl.	
		4,543,500		78.7
Agricultural:				
In cultivation	617,400		10.7	
Out of cultivation:				
Idle	141,100		2.4	
Abandoned	68,600		1.2	
Improved pasture	96,700		1.7	
Total agricultural		923,800		16.0
Other non-forest:				
Prairie, Marsh, Waterways, Towns, villages, Roads, railroads, etc.		306,900		5.3
Total area		5,774,200		100.0

1/ Forest land that does not have the qualities essential for the growth of commercial timber.

Forest Area

Seventy-two percent of the forest area is in the rolling uplands;7 percent in the flatwoods; 10 percent in swamps, bays, ponds, and branches; and 11 percent in river bottoms. In table 2, the forest area of the unit is classified according to forest condition and type-group. The forest conditions are defined as follows:

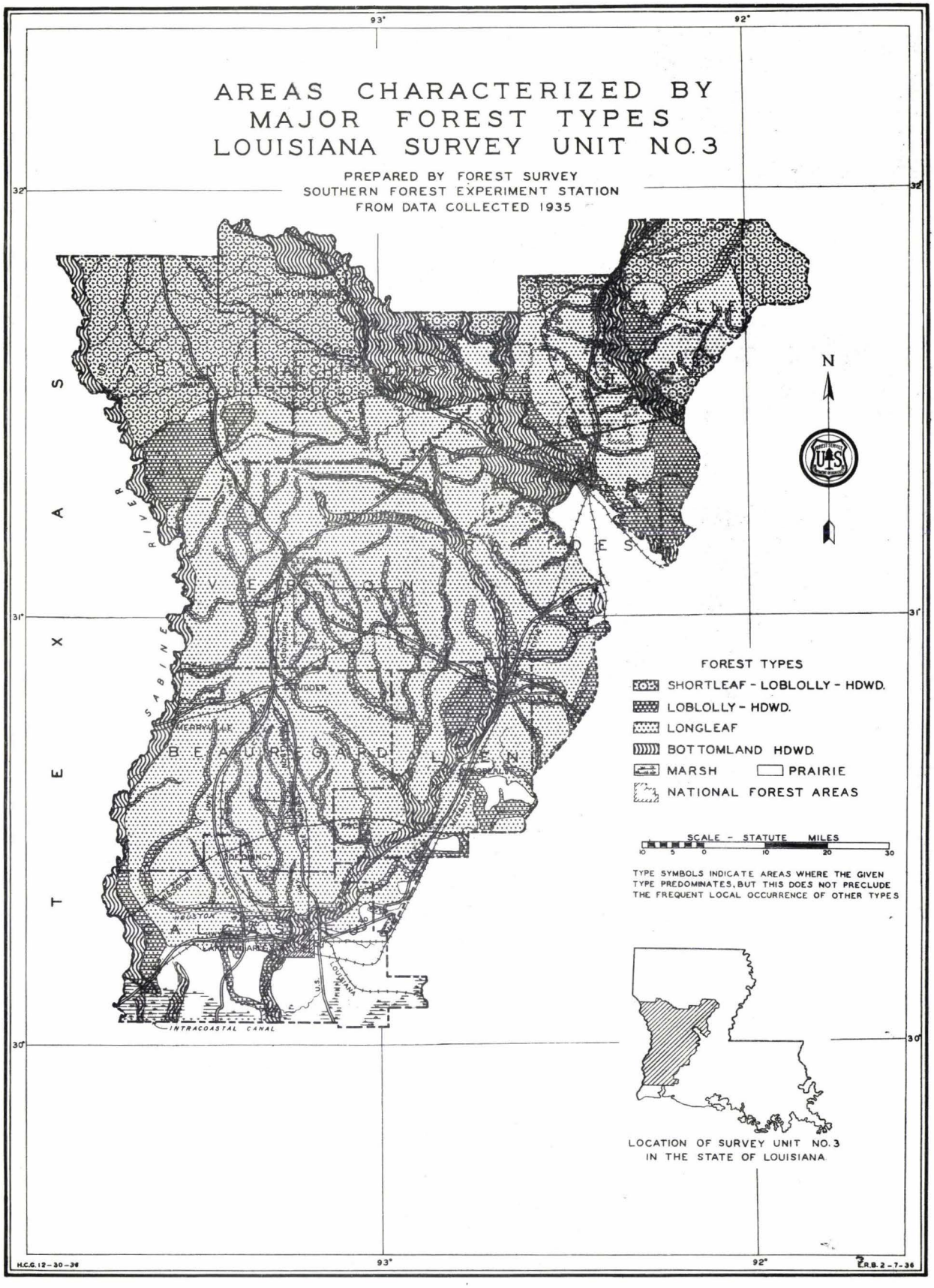
AREAS CHARACTERIZED BY
MAJOR FOREST TYPES
LOUISIANA SURVEY UNIT NO. 3
PREPARED BY FOREST SURVEY
SOUTHERN FOREST EXPERIMENT STATION
FROM DATA COLLECTED 1935
93°
92°
32°
31°
30°
N
FOREST TYPES
SHORTLEAF - LOBLOLLY - HDWD.
LOBLOLLY - HDWD.
LONGLEAF
BOTTOMLAND HDWD.
MARSH
PRAIRIE
NATIONAL FOREST AREAS
SCALE - STATUTE MILES
10 5 0 10 20 30
TYPE SYMBOLS INDICATE AREAS WHERE THE GIVEN TYPE PREDOMINATES, BUT THIS DOES NOT PRECLUDE THE FREQUENT LOCAL OCCURRENCE OF OTHER TYPES
LOCATION OF SURVEY UNIT NO. 3 IN THE STATE OF LOUISIANA
INTRACOASTAL CANAL
H.C.G. 12-30-36
E.R.B. 2-7-36

Figure 1.

Old growth: Stands composed predominantly of sawtimber trees with the characteristics of the original mature trees of the region.

Uncut: Old-growth stands from which less than 10 percent of the volume has been cut.

Partly cut: Old-growth stands from which at least 10 percent of the volume has been removed, but which are still characterized by residual trees from the old-growth forest.

Second growth: Stands that have succeeded the original forest as a result of cutting or other causes.

Sawlog size: Uncut: Second-growth stands in which the sawlog-size trees contain at least 600 board feet per acre, and from which less than 10 percent of the board-foot volume has been cut.

Partly cut: Second growth stands from which at least 10 percent of the board-foot volume has been cut, but which still contain at least 400 board feet per acre in sawlog-size trees.

Under-sawlog size: Second-growth stands composed predominantly of under-sawlog-size trees.

Reproduction: Re-stocking areas bearing 80 or more seedlings per acre that are less than 1 inch in diameter at breast height.

Clear-Cut: Cut-over areas on which the young growth that has come in is insufficient to classify them either as second growth or reproduction.

The forest type-groups are designated by the species that predominate in the stands; other species are associated with them in all groups.

Most of the remaining uncut, old-growth (virgin) pine is located in Vernon, Natchitoches, and Rapides Parishes. A small amount is in LaSalle Parish. A greater part of the uncut, old-growth hardwood is located in the Sabine River bottom in Vernon and Sabine Parishes. Over half of the present longleaf pine type consists of clear-cut areas that have not re-stocked. Practically all of the loblolly and shortleaf pine areas are in second growth.

Table 2. -- Forest area classified according to forest condition and type-group

Forest condition	Forest type-group			Total	Percent of total forest area
	Longleaf pine	Loblolly-shortleaf pine	Hardwoods		
	Acres 1/				
Old growth:					
Uncut	58,500	12,500	145,000	216,000	4.8
Partly cut	64,700	21,000	199,600	285,300	6.2
Total	123,200	33,500	344,600	501,300	11.0
Second growth:					
Sawlog size:					
Uncut	187,100	647,900	246,300	1,081,300	23.8
Partly cut	59,300	365,600	195,700	620,600	13.7
Under-sawlog size	383,500	393,700	245,600	1,022,800	22.5
Reproduction	153,500	49,900	28,900	232,300	5.1
Total	783,400	1,457,100	716,500	2,957,000	65.1
Clear-cut	1,055,600	21,800	6,200	1,083,600	23.9
Total forest area	1,962,200	1,512,400	1,067,300	4,541,900	
Percent of total forest area	43.2	33.3	23.5		100.0

1/ Since classifications totaling less than 45,000 acres may have a relatively large error, they should be considered as indicating only the comparative magnitude of the item.

Board-Foot Volume

In this estimate, as shown in table 3, the stand of sawlog-size trees is expressed in terms of board feet as measured by the Doyle log-rule. The estimate is given as net mill scale, that is, allowance has been made for material that would be left in the woods because of rot, crook, limbiness, and similar reasons; and allowance has also been made for mill cull, that is, sweep and interior defect. Sawtimber trees are here defined as trees that contain at least one usable 12-foot log and that will yield at least 50 percent of their gross volume in sound material; in the case of pines and cypress the minimum breast-height diameter must be 9 inches, and in hardwoods, 13 inches. Trees of valuable species and large diameter are considered merchantable, however, if the value of the material will justify cutting for a smaller proportion than 50 percent of the gross volume.

Table 3. -- Net board-foot volume classified according to species-group and forest condition

Species-group	Forest condition		Total
	Old growth	Second growth	
	Thousand board feet		
Longleaf pine	854,500	269,200	1,123,700
Loblolly and shortleaf pine	199,800	1,789,300	1,989,100
Gums, cottonwood, magnolia, maple, etc.	761,500	563,200	1,324,700
Oaks, beech, hickories, elms, etc. 1/	977,100	1,066,500	2,043,600
Total	2,792,900	3,688,200	6,481,100

1/ Includes cypress.

CORDWOOD VOLUME

In this estimate, the entire stand of good trees 5 inches or over in diameter, outside the bark at breast height, is expressed in terms of standard (4 x 4 x 8 feet) cords. Sawtimber trees, which are covered in the estimate of board-foot volume, are also included in this estimate. In undersawlog-size trees and sawlog-size pines, the trunk is included up to a variable top-diameter, with 4 inches as a minimum; while in sawlog-size hardwoods and cypress only the sawtimber portion is included. No deduction is made for woods cull, that is, that part of the tree that would be left in the woods because of rot, fire-scar, crook, bad knots, or other defects; this deduction would be approximately 4 percent, but sound cull trees that are usable for cordwood would somewhat offset this loss.

In table 4, the cordwood volume is classified according to pulping and nonpulping species-groups. In the longleaf pine type-group, longleaf pine comprises practically all of the pine volume; and in the loblolly-shortleaf pine type-group, practically all of the pine volume is of these species. The pulping hardwood species include red gum, black gum, tupelo, bay, magnolia, maple, and the other softer hardwoods. The nonpulping hardwoods include oak, hickory, beech, ash, elm, etc. Since cypress is generally not used for pulpwood, it is included with the nonpulping hardwoods. That a large part of the longleaf pine is contained in the remaining old-growth stands, while most of the loblolly and shortleaf pine is second growth, is reflected in the fact that only 34 percent of the longleaf pine cordwood volume is in trees less than 13 inches in diameter, while 62 percent of the loblolly and shortleaf pine volume is in these smaller diameters.

The estimate of cordwood volume, classified according to species-groups and diameters of trees, is shown graphically in figure 2.

Table 4. — Cordwood volume of pulping and nonpulping species

Species group	Diameter class 1/	Forest type-group			Total	Percent of total volume
		Longleaf pine	Loblolly-shortleaf pine	Hardwoods		
	-- Inches --	---------- Thousand cords 2/ ----------				
Pulping species:						
Pine	6 & 8	565	3,282	267	4,114	10.7
	10 & 12	1,171	4,185	193	5,549	14.4
	14,16 & 18	1,377	3,476	51	4,904	12.8
	20 & over	1,698	1,360	14	3,072	8.0
Total		4,811	12,303	525	17,639	45.9
Hardwoods	6 & 8	28	722	849	1,599	4.2
	10 & 12	40	768	1,348	2,156	5.6
	14,16 & 18	23	580	1,650	2,253	5.9
	20 & over	5	286	2,072	2,363	6.1
Total		96	2,356	5,919	8,371	21.8
Total pulping species		4,907	14,659	6,444	26,010	67.7
Nonpulping species:						
Hardwoods	6 & 8	175	1,364	1,337	2,876	7.5
	10 & 12	117	1,302	1,547	2,966	7.7
	14,16 & 18	75	1,042	2,149	3,266	8.5
	20 & over	19	506	2,765	3,290	8.6
Total nonpulping species		386	4,214	7,798	12,398	32.3
Total all species		5,293	18,873	14,242	38,408	
Percent of total volume		13.8	49.1	37.1		100.0

1/ Diameter of trees was measured outside of bark $4\frac{1}{2}$ feet from the ground, except on the turpentined pines, on which it was measured 10 feet from the ground. Trees ranging from 5.0 to 6.9 inches in diameter are placed in the 6-inch class; corresponding limits apply to the other classes.

2/ Since classifications totaling less than 400,000 cords may have a relatively large error they should be considered as indicating only the comparative magnitude of the item.

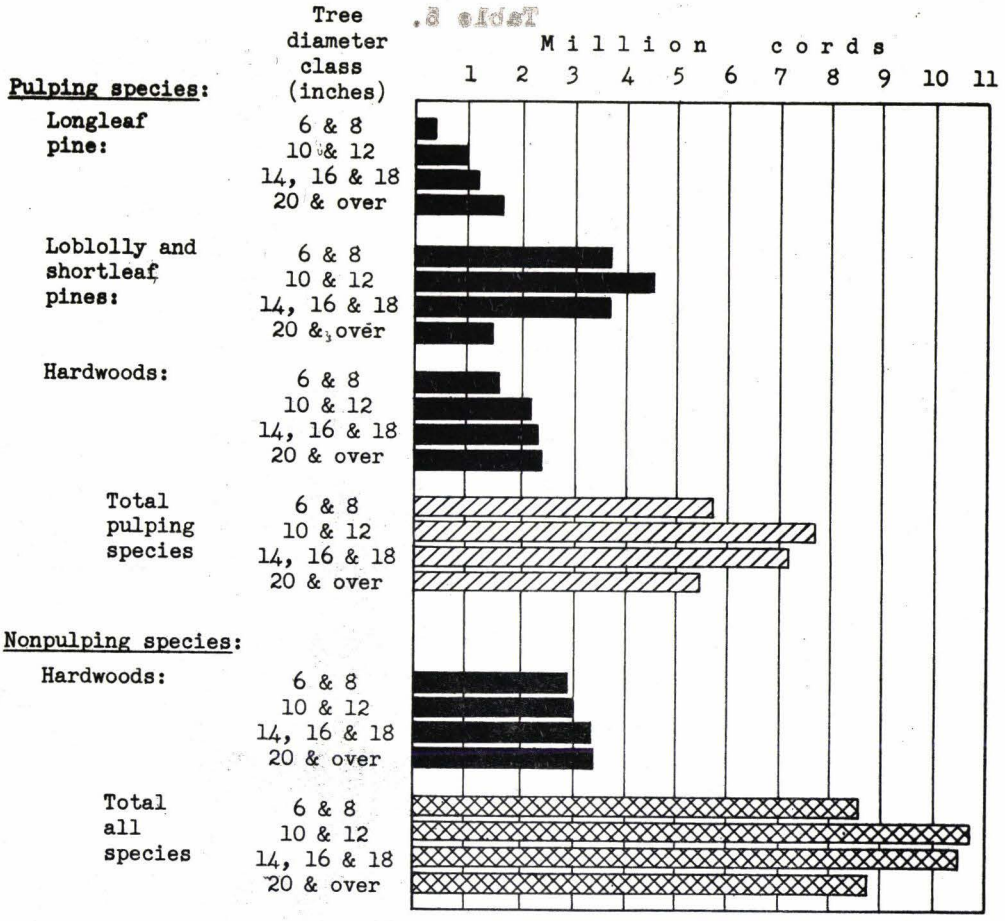

Figure 2. -- Cordwood volume of pulping and nonpulping species

In table 5 is the cordwood volume of pulping and nonpulping species on the average "stocked" acre of each forest type-group, classified according to tree-diameter classes. This average-acre volume in a theoretical per-acre average of the forest stands of all conditions, not including the clear-cut and reproduction areas, whose present cordwood stand in practically nil. This table thus provides a means of comparing the different type-groups with respect to species composition, diameter distribution, and average density.

Other Information

There were operating in this unit in 1935, 112 sawmills of all sizes, 1 pulp mill, and 3 other small primary wood-products plants. Twenty-seven of the sawmills are in the "large mill" class, that is they have a daily capacity of 40,000 board feet or more; while 70 mills have a daily capacity of less than 20,000 board feet. In addition to the pulp mill at Elizabeth, which uses the sulphate process and has a daily capacity of 55 tons of pulp, a 200-ton sulphate mill at Hodge and a 500-ton plant at West Monroe draw a part of their wood supplies from here. At a fourth pulp-and-paper plant, located at Orange, Tex., the paper-mill is active but the pulp mill has been discontinued.

Table 5.

Average gross cordwood volume of pulping and nonpulping species-groups (excluding clear-cut and reproduction) by diameter class and type-group

Species groups	Tree diameter classes	Type-groups		
		Longleaf pine	Loblolly-shortleaf pine	Hardwoods
		Cords		
Pulping species:				
Pines	6 & 8	.70	2.28	.26
	10 & 12	1.41	3.07	.19
	14,16 & 18	1.79	2.41	.05
	20 & over	2.25	.77	.01
Total pines		6.15	8.53	.51
Hardwoods	6 & 8	.04	.50	.82
	10 & 12	.05	.53	1.30
	14,16 & 18	.02	.40	1.60
	20 & over	.01	.20	2.01
Total hardwoods		.12	1.63	5.73
Total pulping		6.27	10.16	6.24
Nonpulping species:				
Hardwoods 1/	6 & 8	.20	.94	1.29
	10 & 12	.14	.90	1.49
	14,16 & 18	.08	.72	2.08
	20 & over	.02	.35	2.68
Total nonpulping		.44	2.91	7.54
Total all species		6.71	13.07	13.78

1/ Cypress is included in nonpulping hardwoods.